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UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

04-1074
(Serial No. 09/136,483)

IN RE SUJEET KUMAR, HARIKLIA DRIS REITZ,
XIANGXIN BI, and NOBUYUKI KAMBE

Appeal from the United States Patent and Trademark Office,
Board of Patent Appeals and Interferences.

**REPLACEMENT BRIEF OF APPELLANTS
SUJEET KUMAR, HARIKLIA DRIS REITZ,
XIANGXIN BI and
NOBUYUKI KAMBE**

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WPH

CERTIFICATE OF INTEREST

Counsel for the Appellants, Sujeet Kumar, Hariklia Dris Reitz, Xiangxin Bi and Nobuyuki Kambe, certifies the following:

1. The full name of every party represented by me is:

Sujeet Kumar,
Hariklia Dris Reitz,
Xiangxin Bi, and
Nobuyuki Kambe.

2. The name of the real party in interest represented by us is:

NanoGram Corporation, a Delaware corporation with corporate offices at 2911 Zanker Road, San Jose, CA 95134.

3. NanoGram Corporation is a privately held corporation.

4. The names of all law firms and the partners or associates that appeared for the party now represented by me in the trial court or agency or are expected to appear in this court are:

Patterson, Thuente, Skaar & Christensen, P.A.
Peter S. Dardi
Tye Biasco

February 20, 2004

By: Tye Biasco
Tye Biasco

DECLINING REQUEST FOR ORAL ARGUMENT

Appellants do not request oral argument.

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STATEMENT OF RELATED CASES

Pursuant to Federal Circuit Rule 47.5, Appellants, Sujeet Kumar, Hariklia Dris Reitz, Xiangxin Bi, and Nobuyuki Kambe note that continuation-in-part patent application 09/433,202 claims priority to the present application and is on appeal before the U.S. Patent Office Board of Patent Appeals. There are no related cases under the jurisdiction of the Federal Courts.

JURISDICTIONAL STATEMENT

This Court has jurisdiction of this appeal under 28 U.S.C. § 1295 because this appeal is at the instance of the applicant and from a decision of the Board of Patent Appeals and Interferences of the Patent and Trademark Office with respect to a patent application.

ABBREVIATIONS AND RECORD REFERENCES

Appellants Sujeet Kumar, Hariklia Dris Reitz, Xiangxin Bi, and Nobuyuki Kambe are referred to as "Appellants," the United States Patent and Trademark Office is referred to as "PTO," and the Board of Patent Appeals and Interferences is referred to as "the Board." U.S. Patent Application No. 09/136,483 is referred to as "the '483 Application."

U.S. Patent No. 5,389,194 is referred to as the Rostoker patent, U.S. Patent 5,128,081 is referred to as the Siegel patent, U.S. Patent No. 5,697,992 is referred to as the Ueda patent and U.S. Patent No. 5,064,517 is referred to as the Shimo patent.

Citations to pages in the Appendix are preceded by the letter A (e.g., A0010). Where available, particular lines or paragraphs of the cited page are provided parenthetically. Citations to the Appendix may also be followed by a description of the document cited.

STATEMENT OF THE ISSUES

Issue 1: Whether the Board of Patent Appeals and Interferences made an error of law in not considering the Declaration of Professor Singh?

Issue 2: Whether the Board of Patent Appeals and Interferences made an error of fact with respect to interpreting the teachings of the Rostoker patent?

Issue 3: Whether the Board of Patent Appeals and Interferences made an error of law with respect to enablement by the Rostoker patent?

STATEMENT OF THE CASE

Sujeet Kumar, Hariklia Dris Reitz, Xiangxin Bi, and Nobuyuki Kambe filed U.S. Patent Application No. 09/136,483 on August 19, 1998. In an Office Action dated March 19, 1999, the Examiner rejected all of the claims. Specifically, in the first Office Action, claims 1-16 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite with respect to the phrase "effectively no." Claims 1-8 and 19-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable any one of U.S. Patent 4,861,572 to Sugoh et al., U.S. Patent 3,406,228 to Hardy et al., U.S. Patent 4,705,762 to Ota et al., U.S. Patent 5,635,154 to Arai et al., U.S. Patent 5,417,956 to Moser and U.S. Patent 5,447,708 to Helble et al. Also, the Examiner rejected claims 1-16 and 19-20 under 35 U.S.C. § 103(a) as being unpatentable over either U.S. Patent 5,804,513 to Sakatani et al. alone or in view of U.S. Patent 5,697,992 to Ueda et al. (the Ueda patent), the Ueda patent alone, U.S. Patent

5,868,604 to Atsugi et al. alone or in view of the Ueda patent, U.S. Patent 4,021,263

to Rosenblum alone or in view of the Ueda patent, U.S. Patent 5,228,886 to Zipperian alone or in view of the Ueda patent, U.S. Patent 5,300,130 to Rostoker alone or in view of the Ueda patent, U.S. Patent 5,389,194 to Rostoker et al. alone or in view of the Ueda patent, U.S. Patent 5,693,239 to Wang et al. alone or in view of Ueda, or U.S. Patent 5,527,423 to Neville et al. alone or in view of the Ueda patent. Furthermore, the Examiner rejected claims 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,064,517 to Shimo (the Shimo patent) or as being unpatentable over the references cited against claim 1, further in view of the Shimo patent.

An Amendment was filed on June 16, 1999 in response to the first Office Action. Appellants updated references to pending applications in the specification and amended claims 1, 10, 15 and 19 to address clarity issues. Claim 1 was also amended to more particularly point out Appellants' claimed invention. Furthermore, claim 4 was canceled and claims 21 and 22 were added.

In a second Office Action dated September 8, 1999, which was made final by the Examiner, the Examiner rejected claim 5 under 35 U.S.C. §112, second paragraph as being indefinite. Also, the Examiner rejected all of the claims for obviousness based on similar rejections as the first Office Action. In the Final Office Action, the Examiner provisionally rejected claims 1-16 and 19-20 under the

judicially created doctrine of obviousness-type double patenting over claims 1-3, 5-9 and 11-16 of copending Application No. 08/961,735 (the '735 application).

Appellants filed an Amendment responding to the final Office Action on November 4, 1999. Appellants amended claims 1, 5 and 17 for clarity. Arguments against the *prima facie* unpatentability of the claims were presented in detail. In response to an Advisory Action of November 22, 1999, Appellants filed a request for Continued Examination on December 8, 1999 that requested entry of the Amendment of November 4, 1999.

Upon further consideration, the Examiner issued a first Office Action final rejection on February 29, 2000. In this rejection, the Examiner rejected claims 1-3 and 5-16 under 35 U.S.C. §112, second paragraph as being indefinite objecting to the reference to "the primary particles" because there was no explicit earlier reference to primary particles. Also, the Examiner rejected claims 1-3, 5-8, and 19-22 as being obvious over any one of U.S. Patent 4,861,572 to Sugoh et al., U.S. Patent 4,705,762 to Ota et al., U.S. Patent 5,635,154 to Arai et al., U.S. Patent 5,417,956 to Moser and U.S. Patent 5,447,708 to Helble et al. (five separate grounds of rejection). In addition, the Examiner rejected claims 1-16 and 19-20 under 35 U.S.C. §103(a) as being unpatentable over either U.S. Patent 5,804,513 to Sakatani et al. alone or in view of U.S. Patent 5,697,992 to Ueda et al. (the Ueda patent), the Ueda patent alone, U.S. Patent 5,868,604 to Atsugi et al. alone or in view of the Ueda patent, U.S. Patent

4,021,263 to Rosenblum alone or in view of the Ueda patent, U.S. Patent 5,228,886

to Zipperian alone or in view of the Ueda patent, U.S. Patent 5,300,130 to Rostoker alone or in view of the Ueda patent, U.S. Patent 5,389,194 to Rostoker et al. alone or in view of the Ueda patent, or U.S. Patent 5,527,423 to Neville et al. alone or in view of the Ueda patent (15 separate grounds of rejection). Again, the Examiner maintained the rejection of claims 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,064,517 to Shimo (the Shimo patent) or unpatentable over the references cited against claim 1 further in view of the Shimo patent (in total 14 separate grounds of rejection). The Examiner did not seem to renew the provisional Obviousness-Type Double Patenting rejection over the claims of copending application 08/961,735, but the Examiner "suggested" that Appellants file a Terminal Disclaimer over copending application 09/433,202 even though no rejection was made.

A response was filed on May 1, 2000 that amended claims 1, 17, and 18 for clarity. Also, Appellants responded in detail that the Examiner had not established *prima facie* unpatentability for any of the claims. Appellants filed a Notice of Appeal on May 30, 2000.

A phone interview took place between Appellants' representative and the Examiner on June 6, 2000. Agreement was not reached on any of the issues. Appellants' filed a draft Request for Reconsideration on August 10, 2000 in

preparation for a subsequent phone interview. In this draft Request For Reconsideration, Appellants argued that the Examiner had failed to establish *prima facie* unpatentability of any of the claims. Upon preparation for this appeal, Appellants realized that the interview summary for the June 6, 2000 phone interview in the draft Request For Reconsideration had not been entered. Therefore, this Request For Reconsideration with the interview summary was submitted for the record on January 21, 2004.

An Appeal Brief was filed on August 30, 2000 addressing all of the rejections of the final Office Action of February 29, 2000.

An Examiner's Answer was mailed on November 16, 2000. The Examiner's Answer only maintained a total of three grounds of rejection out of the 20 grounds of rejections against composition claims 1 and 19 and claims depending from claims 1 and 19, as well as the 14 grounds of rejection of claims 16 and 17. The obviousness type double patenting rejections were similarly dropped. The remaining 31 grounds of obviousness rejection were withdrawn without comment. Appellants filed a Reply Brief directed to the remaining grounds of rejection on December 28, 2000.

The PTO Board of Patent Appeals and Interferences issued a decision on February 27, 2003. The Board reversed the rejection of claims 17 and 18, but affirmed the rejection of claims 1-3, 5-16, and 19-22.

Appellants filed a Request for Reconsideration to the Board on April 27, 2003. Appellants' filing noted two errors of law and one error of fact. The Board issued a denial of the request for rehearing on August 20, 2003. Appellants filed a timely Notice of Appeal to the Federal Circuit on October 14, 2003.

STATEMENT OF THE FACTS

I. Summary of the Invention

The rejection of claims 1-3, 5-16, and 19-22 was affirmed by the Board. The Board reversed the rejection of claims 17 and 18. The rejection of claims 1-3, 5-16, and 19-22 is appealed in this case. Claims 2, 3, and 5-16 depend from independent claim 1, and claims 20-22 depend from independent claim 19.

Appellants' invention involves novel forms of aluminum oxide particles and methods for producing aluminum oxide particles. Specifically, with respect to the aluminum oxide particles, the invention is directed to collections of submicron aluminum oxide particles. Submicron particles have an average diameter less than about 1000 nm (one micron), although the claims are limited to particles with an average diameter less than about 500 nm. The collections of particles have an extremely uniform particle size. This uniformity can be expressed in two ways. First, the distribution of particle sizes around the average drops off very quickly, as claimed in claim 19. In addition, the particle size distribution does not have a tail, such that there are no particles above a certain cut off value, as claimed in claim 1.

The production of highly uniform particles is enabled by the use of laser pyrolysis. These processes are the subject of claims 17 and 18. Unlike standard chemical reactions under equilibrium conditions, the light beam defines a reaction zone in which the reaction is driven to completion. See the specification, for example, at page 4, line 34 to page 5, line 2; page 6, lines 16-27; and page 12, lines 12-23. The extreme amounts of heat in the reaction zone tends to dissociate reactants within the reaction zone. The species then recombine to form the product compositions. The reaction is rapidly quenched as the particles leave the reaction zone. See, page 12, lines 12-23. This quenching terminates further reaction and corresponding particle growth. Since the reaction zone is small and well defined, the product particles are correspondingly uniform.

Pending claim 1 is directed to the uniformity of the particle collection through the cut off in the particle size distribution. In other words, the plot of particle diameters does not have a tail at large diameters. For further description of these uniform particle collections, see the specification, for example, at page 20, line 16 to page 21, line 10. Specifically, less than one particle in one million particles have a diameter more than three times the average diameter. Similarly, pending claim 19 is specifically directed to the sharp drop in the distribution of particle sizes away from the average particle size. This narrow distribution about the average is independent from the lack of a tail in the distribution, although they both relate to the overall

particle size distribution. For example, a distribution could be narrow near its peak but have a tail at larger diameters. Appellants have produced powders with a distribution of particle sizes that is both narrow near its peak and without a tail at larger distributions. This distribution is shown in Fig. 11 of Appellants' specification.

Particle size distribution is a property independent of, but related to average particle size. For example, a tub of baseballs will have an average size that is the size of a baseball. Similarly, a tub with a mixture of basketballs, baseballs and ping pong balls can still have an average size of a baseball, but they have a broader distribution of particle sizes. If the claimed particles are blown-up in size roughly between a million and a billion fold to have an average size of a baseball, they would be like a collection of particles ranging from a grain of sand to huge boulders. The particle size distribution relates to how many particles have the size of a boulder or a grain of sand versus baseball size particles. A narrow size distribution implies fewer if any boulders or grains of sand. Submicron particles with different particle size distributions have distinctly different properties when appropriately measured.

II. The Rostoker Patent

The Rostoker patent is entitled "Methods Of Cleaning Semiconductor Substrates After Polishing." The patent discusses the polishing process to a significant degree. Obtaining the materials for performing the polishing are

discussed in detail in three paragraphs in column 6, lines 25-56. The first paragraph states as follows:

Recently, methods have been developed for controllably producing ultrafine-grained, or nanocrystalline, materials (typically, about 1-100 nm grain diameters). These new methods have made possible the production of new materials having substantially different physical and chemical properties than the large grained, or single crystal, counterparts having substantially the same chemical composition.

The next paragraph discusses in detail the Siegel patent process and materials. The third paragraph of the triad states as follows:

Given the recent advances in methods of producing such nanocrystalline materials, numerous problems in areas such as polishing semiconductor substrates can now be addressed using these new nanocrystalline materials.

It seems clear that the Rostoker patent is directed to polishing of substrates using the materials of the Siegel patent. Upon Appellants' un-refuted evidence that the methods of the Siegel patent do not produce Appellants' claimed materials, the PTO relies upon an assertion that the Rostoker patent does not teach only the Siegel materials. This argument seems almost disingenuous and does not amount an assertion of a positive teaching in the Rostoker patent of anything beyond the disclosure of the Siegel patent.

With respect to the polishing materials of Rostoker patent, these are described at column 7, lines 4-27 as follows:

According to the invention, the alpha aluminum oxide particles used for polishing exhibit the following characteristics. Preferably, the particle

size "X" nm, and the distribution of particle sizes is controlled to within "Y" nm, and the particles used for polishing are "Z" percent (%) in the alpha phase, where:

"X" is 10-100 nm, such as 10, 20, 30, 40 or 50 nm, and is preferably no greater than 50 nm; and

"Y" is approximately "P" percent of "X", where "P" is 10%, 20%, 30%, 40% or 50%, and is preferably no greater than 50% to ensure a narrow (Gaussian) distribution of particle sizes about "X";

"Z" is at least 50%, including at least 60%, 70%, 80% and 90%, and as high as 100%.

A quality factor "Q" is inversely related to "Y", and is a measure of the distribution of particle sizes. "Q" can be calculated as the concentration of particles at the desired size "X", divided by the range of sizes of particles at 3 db (decibels) lower than "X". Preferably, the size distribution of alpha aluminum oxide particles used for polishing exhibits a "Q" of at least 10, including 10, 50, 100, 500, 1000, 5000, or 10,000 ("Q" is dimensionless).

The meaning of this quoted language is in dispute, as described in detail below.

STANDARD OF REVIEW

Review of Board decisions is based on the administrative record as prescribed by the Administrative Procedures Act. See, Dickinson v. Zurko, 527 U.S. 150 (1999). All decisions of law are decided by the reviewing court. Mazzari v. Rogan, 323 F.3d 1000, 1005 (Fed. Cir. 2003). The Court of Appeals for the Federal Circuit reviews the factual findings of the Board based on a substantial evidence standard. In re Hyatt, 211 F.3d 1367, 1372 (Fed.Cir.2000).

As applied in the present case, claim interpretation is a matter of law to be determined de novo by the reviewing appeals court. Markman v. Westview, 52 F.3d 967, 979 (1995), aff'd 517 U.S. 370 (1996). The evaluation as a matter of law with respect to the consideration of the Declaration of Professor Singh is

evaluated de novo by the Appellate Court. The factual issue regarding the interpretation of the Rostoker patent is evaluated on the substantial evidence standard. The scope and content of the prior art are reviewed for substantial evidence. In re Gartside, 203 F.3d 1305, 1316 (Fed. Cir. 2000).

The standard of review of the assertions of lack of enablement of the Rostoker patent are more complex. Appellants do not believe that the standards of review for such a situation have been clearly stated in the precedent. The PTO has the burden of establishing obviousness. In re Oetiker, 977 F.2d 1443, 1445 (Fed. Cir. 1992); see also, concurring opinion of Judge Plager 977 F.2d at 1449. Appellants argue that the Rostoker patent alone or combined with the Ueda patent do not describe Appellants' invention. Assuming arguendo that the references do teach Appellants' claimed invention, Appellants have argued that the references are not enabling with respect to Appellants' claimed invention.

Issued patents are assumed enabling with respect to their claimed subject matter under the presumption of validity. 35 U.S.C. § 282. Generally, clear and convincing evidence is required to rebut this presumption. Dana Corp. v. Am. Axle & Mfg., Inc., 279 F.3d 1372, 1375 (Fed. Cir.2002). Evaluation of enablement is a question of law based on underlying facts. Bruning v. Hirose, 161 F.3d 681, 686 (Fed.Cir.1998). The issues of law regarding enablement of the Rostoker patent are evaluated de novo by the reviewing court. Once a *prima facie*

sufficient showing of clear and convincing evidence is presented by Appellants,

then Appellants believe that the totality of the evidence should be considered to evaluate whether or not the PTO has met their burden of establishing unpatenability by a preponderance of the evidence. The ultimate issue of obviousness is evaluated without deference to the Board as an issue of law, while the underlying facts are evaluated on the substantial evidence standard. See, In re Gartside, 203 F.3d at 1316.

SUMMARY OF THE ARGUMENT

The Examiner did not establish a *prima facie* case of obviousness because the Rostoker patent does not teach Appellants' claimed invention. To the extent that the Rostoker patent teaches Appellants' claimed invention, Appellants' have presented clear and convincing evidence that the Rostoker patent is not enabling with respect to Appellants' claimed invention. Thus, the PTO failed to establish *prima facie* obviousness invention, and to the extent *prima facie* obviousness was shown, Appellants rebutted this evidence, such that the PTO did not carry their burden of establishing unpatentability of Appellants' claimed by a preponderance of the evidence on the record as a whole.

The Rostoker patent, relied upon by the PTO, is far from clear with respect to their claims or the subject matter in their specification. The Rostoker patent describes particle collections with characteristics relating to the particle size

distributions. But the descriptions of the particle size distributions is unintelligible.

Appellants have long pointed to internal inconsistencies in the description. Nevertheless, the PTO maintains that this gobbledygook teaches Appellants' claimed invention. In fact, the PTO Board provided their own interpretation of the description in an Appendix to their Decision On Appeal.

When Appellants presented a Declaration by one of the world's experts in nanotechnology related to polishing applications to refute the explanation in their Appendix, the Board refused to consider the Declaration presented with Appellants' Request For Reconsideration to the Board. The Board's refusal to consider the Declaration was contrary to the Administrative Procedures Act, contrary to the PTO rules, and contrary to fairness to Appellants such that it was an abuse of discretion. Furthermore, even without Professor Singh's Declaration, the Board's decision regarding the interpretation of the Rostoker patent was clearly without support with substantial evidence.

Furthermore, even if assumed *arguendo* that the Rostoker patent teaches Appellants' claimed invention, Appellants have presented clear and convincing evidence that the Rostoker patent does not enable the practice of Appellants' claimed invention. In particular, the only explicit way taught by the Rostoker patent for making particle collections using a process of the Siegel patent has been shown with un-refuted evidence to be incapable of leading to Appellants' claimed

particle collections. The PTO's remaining argument is that the Rostoker patent does not say that the Siegel patent process is the only process for making the particle collections.

Thus, in the complex area of nanotechnology, the PTO seems to assert that a desire to make some novel material is enough to enable it. The PTO does not point to a commercial source or any other source. Wishful thinking seems to be enough enablement for the PTO. Nevertheless, Appellants have provided evidence to the contrary, in particular, a Declaration by Dr. Kambe, one of the inventors as well as other objective evidence. Appellants' have presented clear and convincing evidence that the Rostoker patent is not enabling with respect to Appellants' claimed invention. Furthermore, Applicants have directly refuted all evidence of enablement pointed to by the PTO in the Rostoker patent.

When viewing the totality of the record, it is clear that the PTO has failed by a substantial degree to meet their burden of establishing obviousness by a preponderance of the evidence.

ARGUMENT

I. Preliminary Comments On Claim Interpretation

With respect to claim interpretation, the Board modified its claim interpretation of claim 1 in its denial On Request For Rehearing. (See, A763). The Board, however, maintained its claim construction of claim 19 from the

Decision on Appeal. The Board modified its interpretation of claim 1 due to language in claim 1 indicating that "the collection of particles include less than about 1 in 10^6 particles having a diameter greater than about three times the average diameter of the collection of particles" and language in the specification directly linking such a statement with the cut off of the tail of the distribution. The Board declined to modify its interpretation of claim 19 since it did not describe the identical language that was directly linked to the cut off in the tail of the particle size distribution. However, the Board missed the point since Appellants never asserted that the uniformity of the particles in claim 19 was expressed in terms of lack of a tail.

The Board's denial of modifying their interpretation of claim 19 ignores the true meaning of the language of the claim. The Decision on Appeal (A007) seems to imply that the Board's interpretation was removing the uniformity feature from the claims. The Board has never clarified whether or not they were acknowledging the uniformity of the particle collections claimed in claims 19-22.

Due to the Board's modification of interpretation of claim 1, Appellants' believe that the Board and Appellants agree on the legal basis for interpreting the claims. The legal standards were summarized in Appellants' Request For Reconsideration at pages 2 and 3. (A732-A733).

Claims 1 and 19 are both directed to particle collections with size distributions that are narrow. The explicit language in claim 1 is directed to distributions that lack a tail in the distribution. The Board acknowledged this in its denial of Request For Rehearing. (A764). Claim 19 explicitly recites a distribution that is narrow at the peak of the distribution. At present, the Board's interpretation of claim 19 is unclear. As claim 1 and claims depending from claim 1 remained rejected by the Board, claim construction alone is not a dispositive issue.

II. A *Prima Facie* Case of Obviousness Was Not Established Since The Board Incorrectly Interpreted the Teachings Of The Rostoker Patent.

A. The Board Should Have Considered The Declaration Of Professor Singh

The Board's refusal to consider Professor Singh's Declaration (A743-A754) in Appellants request for Reconsideration represented both legal error contrary to the Administrative Procedures Act (5 U.S.C. § 554) as well as a misapplication of the Patent Office's own procedure. In addition, the Board's position represented a clearly unfair approach to Appellants' application rising to the level of abuse of discretion.

Patent prosecution generally would fall under the direction of 5 U.S.C. § 554, which relates to adjudications under the Administrative Procedures Act. Under subsection (c)(1) of section 554, "The agency shall give all interested parties

opportunity for - the submission and consideration of facts, arguments, offers of settlement, or proposals of adjustment when time, the nature of the proceedings, and the public interest permit." Time, the nature of the proceedings and the public interest certainly allowed the consideration of Professor Singh's Declaration under Appellants' Request for Reconsideration to the PTO Board. (See, A730-A760). The Board justified its refusal to consider Professor Singh's Declaration based on 37 C.F.R. § 1.195. (See, A766, Denial of Request For Rehearing at page 6). Since 37 C.F.R. § 1.195 is contrary to 5 U.S.C. § 554, the Patent Office rule is unenforceable. To the extent that In re Rothermel, 276 F.2d 393 (CCPA 1960) is contrary, this case has been overruled on this matter sub silentio by Dickerson v. Zurko, 527 U.S. 150 (1999). Since the Board's reasoning for refusing to consider Professor Singh's Declaration is contrary to statute, it cannot sustain review.

Even if 37 C.F.R. § 1.195 is controlling, the Board's decision is contrary to the rule. The Board asserted, "appellants have failed to provide a showing of good and sufficient reasons as to why this declaration was not earlier presented." (See, A766). But at page 5 of Appellants' Request For Rehearing, Appellants stated "Since the Board has presented further evidence in their [sic] decision [Appendix to Decision], Appellants also present further evidence in the form of a Declaration by an expert and further arguments in rebuttal." The Board did not explain how Appellants could rebut the Board's evidence in the Appendix of the Decision On

Appeal before the Board presented the evidence. Appellants very clearly explained why the Declaration was not and could not have been presented earlier. Therefore, the Board's basis for not considering Professor Singh's Declaration is clearly in error since Appellants presented an irrefutably good reason why the Declaration was not presented earlier.

Furthermore, not considering the Declaration is manifestly unfair. The Patent Office only maintained 2 of the twenty grounds of rejection presented against claims 1, 19, and claims depending there from upon the filing of Appellants' Appeal Brief. Thus, eighteen grounds of rejection clearly were not well founded. Then, the Board presents further evidence in an Appendix of their decision. Upon Appellants' presentation of clear rebuttal evidence following a tortuous route presented by the Patent Office, the Board refused to consider it. Thus, Appellants faced the option of going back with the Declaration to the Examiner, who does not have authority to overrule a Board decision. Then, Appellants would need to appeal the case again to the Board to get Professor Singh's Declaration considered by the Board. This would add three to four years to the process just to present evidence to rebut a factual showing presented for the first time in the Appendix of the Board's initial decision. This makes no sense with respect to judicial economy and is manifestly unfair to Appellants who depend on a

reasonable patent process for their operation. Therefore, the failure to consider

Professor Singh's Declaration was clearly an abuse of discretion.

For all of the reasons described above, the Board's decision not to consider the Declaration of Professor Singh was contrary to law. Upon consideration of Professor Singh's Declaration, clearly no substantial evidence supports the Board's interpretation of the Rostoker patent.

Specifically, the Board noted the specification of a quality factor, "Q", in the Rostoker patent without giving meaning to the term. (See, A008, Decision on Appeal at page 8). In support of this proposition, Appellants presented a Declaration of one of the world's leading experts in this technology, Professor Singh. Professor Singh's Declaration makes it clear that the quantity "Q" is simply not well defined in the Rostoker patent. This Declaration was prepared for another application of NanoGram Corporation for a closely related Rostoker patent 5,626,715, which is identical in relevant aspects with Rostoker patent, 5,389,194 under the present rejection. (Note that the Singh Declaration inadvertently referred to the patent number as 5,128,081, which is the Siegel patent referred to in both Rostoker patents.) The deficiencies of the Rostoker patent are further developed below.

**B. The Board's Factual Conclusions Regarding the Teachings
Of The Rostoker Patent Lack Substantial Evidence**

Even without Professor Singh's Declaration, the Board's factual determination regarding the teachings of the Rostoker patent is not supported by substantial evidence. With all due respect, the Board's analysis of the Rostoker patent in their Appendix ignores the discussion of "Q." The Board has made a reasonable attempt at giving meaning to "Y" based on prophetic examples briefly discussed in Rostoker. But their interpretation does not follow from the Rostoker patent. In particular, the Rostoker patent goes on to indicate the "Y" is related to a quality factor "Q." "Q" is something that is calculated from the actual distribution of particle sizes. "Y" does not have the simpler definition suggested by the Board. In particular, the Rostoker patent at column 7, lines 18-26 states that

A quality factor "Q" is inversely related to "Y", and is a measure of the distribution of particle sizes. "Q" can be calculated as the concentration of particles at the desired size "X", divided by the range of sizes of particles at 3 db (decibels) lower than "X". Preferably, the size distribution of alpha aluminum oxide particle used for polishing exhibits a "Q" of at least 10, including 10, 50, 100, 500, 1000, 5000, or 10,000 ("Q" is dimensionless).

Due to its relationship to "Q" which is explicitly but unintelligibly defined, "Y" cannot be so easily defined as the Board has asserted. Thus, the Board's interpretation ignores the full teaching of the Rostoker patent. Even within the Board's view, the use of +/- terminology of the Board's Appendix at most interprets one parameter of the particle size distribution. Within this notation, the spread

generally is a confidence interval based on a particular probability level. (See, A756-A760, which are pages from a Quantitative Analysis text). The probability level is not specified. Thus, even the Board's distribution does not exclude a tail in the distribution contrary to the subject matter of Appellants' claim 1 or necessarily indicate a uniformity as specified in Appellants' claim 19.

Appellants maintain that the distribution of particle sizes specified in the Rostoker patent cannot be interpreted in any definite way. The Board's interpretation is based on clear factual error due to ignoring a portion of the discussion in the Rostoker patent and imposing their own interpretation on unclear language without any basis in the reference. The Board cannot simply rewrite the Rostoker patent to their liking. Accordingly, due to the inability to interpret the description in the Rostoker patent, the Rostoker patent does not *prima facie* render obvious claims 1-3, 5-16, and 19-22. Substantial evidence does NOT support the Board's interpretation of the Rostoker patent.

III. The Board's Evaluation Of Enablement Of The Rostoker Patent Was Legally In Error And Not Based On Substantial Evidence

Even assuming *arguendo* that the Rostoker patent can be interpreted to describe Appellants' claimed invention, clear and convincing evidence of record indicates that the Rostoker patent is not enabling with respect to Appellants' claimed invention. In its Decision on Appeal, the Board agreed with the Examiner that Rostoker does not state that the only method of making the aluminum oxide

particles used in the claimed invention is by the method disclosed in the Siegel patent and that Rostoker merely references the Siegel patent as one known method for controllably producing the ultrafine-grained or nanocrystalline materials. (A006). However, the Board made a clear error of law in evaluating Appellants' rebuttal evidence. In particular, Appellants clearly rebutted the enablement of the disclosure of the Rostoker patent with respect to the practice Appellants' claimed invention without undue experimentation. The Board inappropriately and contrary to law shifted the burden to Appellants to prove patentability rather than the failure of the Rostoker disclosure to enable the practice of Appellants' claimed invention. The Board did not even attempt to rebut Appellants' evidence relating to the enablement provided by the Rostoker patent.

The proposition is well established that the cited art only renders a composition of matter or apparatus unpatentable to the extent that the cited art enables the disputed claims or, in other words, if the cited art provides a means of obtaining the claimed composition or apparatus. Assertions in a prior art reference do not support an anticipation or obviousness rejection unless the references place the claimed invention in the hands of the public. Beckman Instruments Inc. v. LKB Produkter AB, 892 F.2d 1547, 1551 (Fed. Cir. 1989). "In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." Id. While a properly citable reference is prior art

for all that it teaches, references along with the knowledge of a person of ordinary skill in the art must be enabling to place the invention in the hands of the public. In re Paulsen, 30 F.3d 1475, 1479 (Fed. Cir. 1994). See also, In re Donohue, 766 F.2d 531, 533 (Fed. Cir. 1985). "[A] § 102(b) reference "must sufficiently describe the claimed invention to have placed the public in possession of it." Paperless Accounting, Inc. v. Bay Area Rapid Transit Sys., 804 F.2d 659, 665 (Fed. Cir. 1986), cert. denied, 480 U.S. 933 (1987)(quoting In re Donohue, 766 F.2d at 533). An enabling disclosure is one that allows a person of ordinary skill to practice the technology without undue experimentation based on the guidance in the disclosure along with what is well known in the art. In re Wands, 858 F. 2d 731, 737 (Fed. Cir. 1988).

See also, Ex parte Logan, 38 USPQ2d 1852, 1856 (BPAI 1994) (unpublished). While this Board case is not binding precedent or even published, it is probative of an appropriate analysis under the present facts. In Ex parte Logan, Id., the claims were rejected over a patent and a corresponding patent application. In response to the rejection, appellants argued that the cited patent and application were inoperable. In support of the appellants' assertions, a declaration was presented. The Examiner dismissed the declaration as mere opinion by an interested party. The Board in this case noted that the factual evidence presented in the declaration was probative of the issues. Furthermore, the Examiner did not

offer any evidence or argument that the required modifications to make the previous invention functional would have been made by a person of ordinary skill in the art. The board concluded that the appellant had met their burden of rebutting the presumption of operability of the prior art patent by a preponderance of the evidence. Id. In reaching this holding, the court expressly noted that, “the examiner has failed to shoulder his burden of rebutting the appellant’s evidence of non-enablement/inoperability.” Id.

The point is further taken in In re Payne, 606 F.2d 303, 315 (C.C.P.A. 1979) (citing In re Hoeksema, 399 F.2d 269, 275 (CCPA 1968)), where the Court stated, “To successfully rebut the examiner’s *prima facie* case of enablement, it was incumbent upon Payne [appellant] to introduce affidavits or other factual evidence in support of his position. ...facts set forth in an affidavit (37 CFR 1.132) of an expert in the field suggesting that inoperativeness, would be highly probative.” Id. (citations omitted).

Under the present facts, the Examiner and the Board have erroneously placed the burden on Appellants to show that there is no known way in the art to practice Appellants' claimed invention. This burden is the Examiner's and not Appellants'. Under the assumptions ignoring the previous sections of this Request, it is only Appellants' burden to establish by clear and convincing evidence that the disclosure in the Rostoker patent does not enable one of ordinary skill in the art to

practice Appellants' claimed invention. Appellants have more than adequately met their burden and the requirement of a different burden is an error of law.

The Rostoker patent only explicitly refers to the Siegel patent as a source for ultrafine powders. Appellants have presented substantial evidence the methods of the Siegel patent do not enable the practice of Appellants' claimed invention. This fact does not seem to be in dispute.

The Board and the Examiner asserted (See, A004) that the Rostoker patent does not state that the only method of making the particles is by the method of Siegel. While arguably the Rostoker patent does not indicate that the Siegel method is the only way of making the particles, a mere suggestion that it is not limited to the Siegel method is not the equivalent of enabling disclosure. It is the Rostoker patent that must be enabling, not some unspecified other way of making the particles.

Appellants' have presented unrebutted evidence that the Siegel patent does not enable the practice of Appellants' claimed invention. The Board does not seem to question this rebuttal evidence. The only other possible source of enablement in the Rostoker patent is the mere suggestion that there may be other unspecified ways of obtaining the particles. The implication that there may be other unspecified ways of making the particles can only be enabling disclosure if the unspecified ways are known to a person of ordinary skill in the art. A person of

ordinary skill in the art would need to exert at least undue experimentation unless the skilled artisan knows how to make or obtain the claimed particles without any further guidance since Rostoker does not provide any guidance.

In the Board's denial of Request For Rehearing (See, A767-A768), the Board indicated that "A reference is presumed operable and the burden is on applicant to provide facts rebutting this presumption of operability. See, In re Sasse, 629 F.2d 675, 681, 207 USPQ 107, 111 (CCPA 1980)." Thus, the Board as well as the Examiner have pointed to no enabling disclosure in the Rostoker patent nor do they see any reason to point to any. The Board does not seem bothered by the fact that neither it nor the Examiner have pointed to any evidence of enablement in the Rostoker patent.

Since there is no explicit description relating to enablement in the Rostoker patent, the issue is whether or not a person of ordinary skill in the art would know of a way of making or obtaining the claimed particles without any guidance, and Dr. Kambe's Declaration (A635-A639) is directly on point. This is contrary to the Boards' determination that "this declaration is unpersuasive since it fails to address the examiner's *prima facie* showing of obviousness of the claimed collection of particles." (A009). The Board also asserts that Dr. Kambe's Declaration is "unsupported by any type of evidentiary showing." Id. This assertion is based on a misunderstanding of what Appellants were demonstrating. Dr. Kambe is

certainly a person with at least ordinary skill in the art. He was selected by the International Center for Materials Research to lead an effort for the production of ultrafine particles based on laser pyrolysis. Dr. Kambe's experiences built on his extensive technical experiences as a senior scientist at NTT in Japan and his Ph.D. from MIT. Dr. Kambe's Declaration directly addressed that a person of ordinary skill in the art could not practice Appellants' claimed invention based on the meager disclosure in the Rostoker patent. Nothing more was needed to be shown. Perhaps, the Boards' complaints should be directed to the meager disclosure in the Rostoker patent not to the showing in the Kambe Declaration since the Rostoker patent provided essentially nothing to refute. Appellants' burden with respect to refuting enablement is lower not higher because the guidance provided by Rostoker was nonexistent. To make Appellants' burden higher because the Rostoker patent provides no guidance on the production of the claimed particles is unreasonable and contrary to the law.

The Board's and Examiner's implied assertion that Appellants must provide evidence of more with respect to showing that there is no other way of making Appellants' claimed invention is a shifting of burdens contrary to the law. Appellants' simply do not as a matter of law have the burden to prove patentability if the Rostoker patent only suggests that there may be some unspecified way of making Appellants' claimed invention. Appellants' have clearly rebutted the

presumption of enablement of the Rostoker patent by clear and convincing evidence. If a person of ordinary skill in the art could practice the claimed invention without undue experimentation based on the disclosure in the Rostoker patent, the Examiner should easily be able to support that assertion with some kind of evidence. The Examiner has presented no evidence to support the enablement of the Rostoker patent with respect to Appellants' claimed invention. Neither the Board nor the Examiner have given any hints of how the Rostoker patent is enabling. Appellants have more than met their burden, and the rejection should be withdrawn.

While the pending rejection on appeal was based on obviousness over the Rostoker patent alone or in combination with the Ueda patent, the Board's analysis in the Decision On Appeal does not mention the Ueda patent. Therefore, we assume that the Board's decision relies exclusively on the Rostoker patent such that the Ueda patent does not need to be discussed further.

CONCLUSION

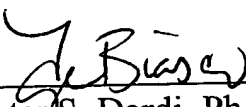
For reasons stated above, it is respectfully submitted that the PTO failed to establish a *prima facie* case of obviousness because the Rostoker patent does not teach the subject matter of Appellants' claimed invention. To the extent that the PTO has established *prima facie* obviousness, Appellants assert that they have met their burden in rebutting the Examiner's *prima facie* case by presenting clear and

convincing evidence that the Rostoker patent is not enabling with respect to Appellants' claimed invention. When viewing the evidence as a whole, the PTO clearly has not proven obviousness by a preponderance of the evidence. Appellants respectfully request the reversal of the rejection of claims 1-3, 5-16, and 19-22 and allowance of the claims.

Respectfully submitted,

PATTERSON, THUENTE,
SKAAR & CHRISTENSEN, P.A

Dated: February 20, 2004

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The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

DOCKETED

Ex parte SUJEET KUMAR, HARIKLIA DRIS REITZ, XIANGXIN BI
and NOBUYUKI KAMBE

Appeal No. 2001-1031
Application 09/136,483

MAILED

FEB 27 2003

PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

ON BRIEF

Before GARRIS, LIEBERMAN, and POTEATE, Administrative Patent Judges.

POTEATE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1-3 and 5-22, which are all of the claims pending in the application.

A001

Claims 1, 17 and 19 are representative of the subject matter on appeal and are reproduced below:

1. A collection of particles comprising aluminum oxide, the collection of particles having an average diameter of primary particles from about 5 nm to about 500 nm and less than about one in 10^6 particles have a diameter greater than about three times the average diameter of the collection of particles.

17. A method for producing a collection of aluminum oxide particles having an average diameter from about 5 nm to about 500 nm, the method comprising:

flowing a molecular stream through a reaction chamber, the molecular stream comprising an aluminum precursor, an oxidizing agent, and an infrared absorber; and
pyrolyzing the flowing molecular stream in a reaction chamber, where the pyrolysis is driven by heat absorbed from a continuous wave laser beam.

19. A collection of particles comprising aluminum oxide, the collection of particles having an average diameter from about 5 nm to about 500 nm and a distribution of particle sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

The references relied upon by the examiner are:

Shimo	5,064,517	Nov. 12, 1991
Rostoker et al. (Rostoker)	5,389,194	Feb. 14, 1995
Ueda et al. (Ueda)	5,697,992	Dec. 16, 1997

GROUND OF REJECTION¹

1. Claims 1-3, 5-16 and 19-22 stand rejected under 35 U.S.C. § 103 as unpatentable over Rostoker alone or in view of Ueda. We affirm.

2. Claims 17 and 18 stand rejected under 35 U.S.C. § 103 as unpatentable over Shimo. We reverse.

¹The following grounds of rejection have been withdrawn:

1. The rejection of claims 1-3 and 5-16 under 35 U.S.C. § 112, second paragraph as indefinite;

2. The rejection of claims 1-3, 5-8 and 19-22 as unpatentable under 35 U.S.C. § 103 over any one of Sugoh, Ota, Arai, Moser and Helble;

3. The rejection of claims 1-3, 5-16, and 19-22 as unpatentable under 35 U.S.C. § 103 over Ueda and over Sakatani, Atsugi, Rosenblum, Zipperian, Rostoker '130, and Nevelle, taken alone or in view of Ueda;

4. The rejection of claims 17 and 18 as unpatentable under 35 U.S.C. § 103 over Sugoh, Ota, Arai, Moser, Helble, Sakatani, Ueda, Atsugi, Rosenblum, Zipperian, Rostoker 130, Rostoker 194 and Neville, and further in view of Shimo;

5. The provisional obviousness-type double patenting rejection of claims 1-3, 5-16 and 19-22 as unpatentable over claims 1-3, 5-9 and 11-16 of copending application no. 08/961,735. See Examiner's answer, paper no. 22, mailed November 16, 2000, pages 3-5, paragraph (10), Grounds of Rejection. This application has now issued as U.S. Patent No. 6,290,735 (September 18, 2001).

Appellants indicate that an issue on appeal is "[w]hether the claims are obvious over the claims of copending application 09/433,202?" Appeal brief, paper no. 19, received September 5, 2000. The claims have not, however, been finally rejected over the claims of copending application 09/433,202. See Final rejection, paper no. 14, mailed February 29, 2000, page 13 ("the examiner has not made an ODP rejection over the CIP application (09/433,202).")

BACKGROUND

The invention relates to collections of submicron aluminum oxide particles. Appeal brief, page 3, second paragraph. The particles are used, for example, for polishing hard materials such as semiconductors, ceramics, glass and metal. Specification, page 1, lines 15-17. The invention is further directed to a process for producing these particles using laser pyrolysis. Appeal brief, page 3, third paragraph.

According to appellants, the claimed collections of particles are extremely uniform in particle size. Appeal brief, page 3, second paragraph. Uniformity refers to the fact that the distribution of particle sizes around the average drops off very quickly and the particle size distribution does not have a tail, i.e., there are no particles above a certain cut off value. Id. Uniformity is important to ensure optimum polishing conditions. See specification, page 4, lines 10-18. In particular, particles which are larger than a certain cut off value tend to scratch the surface being polished, while particles which are significantly smaller than a desired cut off value are less effective in ~~polishing and dilute the polishing composition with essentially~~ useless material. See e.g., Rostoker, column 7, lines 55-61; Appeal brief, page 22, third paragraph.

DISCUSSION

1. Rejection of claims 1-3, 5-16 and 19-22 under 35 U.S.C. § 103 as unpatentable over Rostoker alone or in view of Ueda.²

The examiner found that:

Rostoker et al. teach a polish comprising alumina particles having a size within the claimed range and therefore no distinction is seen to exist because the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

Examiner's answer, page 4.

Appellants concede that Rostoker discloses aluminum oxide particles having an average particle size which overlaps the claimed average particle size. See appeal brief, page 14, second paragraph. However, appellants maintain that Rostoker does not disclose or suggest the particle size distribution of the claimed

²For purposes of this appeal, appellants separately argue the patentability of three groups of claims: (1) claims 1-3 and 5-16, (2) claims 17 and 18, and (3) claims 19-22. In accordance with 37 CFR § 1.192(c), we shall decide the appeal as to this ground of rejection on the basis of claims 1 and 19. Ueda is relied on by the examiner as disclosing that it is known to use non-aqueous or aqueous mediums in making polishing compositions. ~~See Examiner's answer, page 4, last sentence. Neither claim 1~~ nor claim 19 includes a limitation relating to the medium in which the claimed particles are dispersed (such limitation is present in claim 9 and the claims which depend therefrom). Accordingly, we need not address the Ueda patent.

collection of particles. Id. In this regard, appellants note that "[t]he particle size distribution is an independent property of the powders. Thus, two collections of powders can have the same average particle size, but a very different particle size distribution." Id. Appellants provide several reasons as to why Rostoker does not disclose or suggest the particle size distribution recited in claims 1 and 19. For the reasons discussed below, we do not find appellants' arguments persuasive.

Appellants argue that the only process disclosed by Rostoker for obtaining nanoparticles of aluminum oxide is a process described in U.S. Patent No. 5,128,081 to Siegel et al. (the Siegel patent). Appeal brief, page 22. According to appellants, the Siegel patent describes the use of a gas phase condensation method which leads to a tail at larger particle sizes such that the resultant particle size distribution is outside of appellants' claimed ranges. Id. As pointed out by the examiner, Rostoker does not state that the only method of making his particles is via the method disclosed in the Siegel patent. Examiner's answer, page 6, second paragraph. Rather, ~~Rostoker merely references the Siegel patent as disclosing one~~ known method for controllably producing ultrafine-grained or nanocrystalline materials. See Rostoker, column 6, lines 24-34.

In making a patentability determination, analysis must begin with the question, "what is the invention claimed?" since "[c]laim interpretation, . . . will normally control the remainder of the decisional process." Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1567-68, 1 USPQ2d 1593, 1597 (Fed. Cir.) cert. denied, 481 U.S. 1052 (1987). Claims 1 and 19 both claim "A collection of particles comprising" Use of the word "comprising" does not preclude the presence of additional components or particles. See In re Baxter, 656 F.2d 679, 686, 210 USPQ 795, 802 (CCPA 1981). Thus, as pointed out by the examiner, the claims, as drafted, do not preclude the presence of a tail. See Examiner's answer, page 7. Further, claims 1 and 19 are not in any way limited to a collection of particles produced by Appellants' laser pyrolysis method. See In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). (In determining the patentability of claims, the PTO gives claim language its "broadest reasonable interpretation" consistent with the specification and claims).

In any event, we are further in agreement with the examiner ~~that Rostoker discloses a collection of particles having both the~~ sizes and distribution within appellants' claimed ranges, i.e., Rostoker appears to disclose a collection of particles which do

not include a tail. See Examiner's answer, page 6, first paragraph. In support of his position, the examiner references the teachings in column 7, the examples, and claim 10 of Rostoker. Id. Appellants argue that they are unable to understand Rostoker's teachings relating to particle distribution and, therefore, are unable to make a comparison with their claimed distributions. See Reply brief, page 8, second paragraph. We find the examiner's reference to specific teachings in Rostoker sufficient to establish a prima facie case of obviousness.³

With respect to the existence of a tail in Rostoker's collection of particles, we note that Rostoker discloses a quality factor "Q" which is inversely related to distribution of particle sizes. See Rostoker, column 7, lines 6-18. According to Rostoker, maintaining a high "Q", i.e., a high concentration of particles around the average particle size, ensures superior polishing because it minimizes particles which are significantly

³For appellants' reference, sample calculations showing the overlap in Rostoker's particle distribution with the claimed particle distribution is provided in the appendix attached hereto. The examiner and appellants may wish to consider whether Rostoker anticipates any of the claims as presently drafted in the event that appellants elect to continue prosecution of this application.

larger or smaller than the average. See column 7, lines 19-26 and lines 55-61. These teachings suggest that Rostoker's collection of particles have an extremely uniform particle size and do not include a tail. Accordingly, we find that the examiner has established a prima facie case of obviousness with respect to claims 1 and 19.

In support of their arguments that the claimed invention is nonobvious, appellants rely on the Kambe declaration. See Reply brief, page 8, last paragraph. We agree with the examiner that this declaration is unpersuasive since it fails to address the examiner's prima facie showing of obviousness of the claimed collections of particles. See Examiner's answer, page 7. "[T]he Kambe declaration was submitted by Applicants as support that other approaches for the formation of Applicants' claimed invention are not available." Reply brief, page 8, last paragraph. As discussed above, Rostoker teaches a collection of particles having sizes and distributions within the claimed ranges (see Examiner's answer, pages 7-8) and the claims as drafted are not limited to particles produced by a particular method. Further, as alluded to by the examiner (see Examiner's answer, page 8), Mr. Kambe's assertions are unsupported by any type of evidentiary showing.

Accordingly, the rejection is affirmed.

2. Rejection of claims 17 and 18 under 35 U.S.C. § 103 as unpatentable over Shimo

The examiner found that Shimo "teaches a method of making aluminum oxide which comprises all of the claimed steps and therefore no significant difference is seen to exist [between Shimo and the claimed invention] in the absence of any evidence showing the contrary." Examiner's answer, page 5, third paragraph. Appellants note that Shimo teaches a process wherein gaseous reactants are placed within a reaction chamber and therefore, "does not teach or suggest reacting a *flowing* reactant stream." Appeal brief, page 24, second paragraph. The examiner maintains that because Shimo's vapor has flowing capabilities, i.e., is not 100% still, it reads on the claimed method. Examiner's answer, page 7, second paragraph.

In general, claim terms in a patent application are given their ordinary meaning as used in the field of the invention unless the specification indicates that a word has special meaning. In re Thrift, 298 F.3d 1357, 1364, 63 USPQ2d 2002, 2006 (Fed. Cir. 2002). Appellants urge that the term "flow" means a net movement of fluid, not the capability to flow or the random

motions of individual gas particles. See Reply brief, page 12, third and fourth paragraphs (referencing the definition of flow from Webster's Tenth Collegiate Dictionary, attached to the reply brief). We also note that claim 17 utilizes the term "flowing" in conjunction with movement of a molecular stream through a reaction chamber. A "stream" is defined as a continuous procession moving in one direction. See, generally, Webster's Third New International Dictionary 2258 ('stream 2c) (1971). Accordingly, we agree with appellants that the language of claim 17 clearly defines over Shimo's method wherein the vapor reactants are held in a glass vessel during irradiation and are not in the form of a stream flowing through a reaction chamber.

The rejection is reversed.⁴

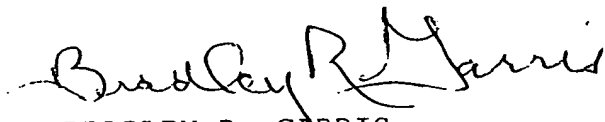
In summary, we affirm the rejection of claims 1-3, 5-16 and 19-22 under 35 U.S.C. § 103 as unpatentable over Rostoker alone or in view of Ueda and reverse the rejection of claims 17 and 18 under 35 U.S.C. § 103 as unpatentable over Shimo.

⁴ We base our reversal of this ground of rejection solely on the facts and reasons relied on by the examiner in support of the rejection. We note, in particular, that the examiner does not assert that it would have been obvious to have replaced Shimo's batch process wherein reactants are held in a chamber during irradiation with a continuous process wherein reactants flow through a reaction chamber during irradiation.


TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

AFFIRMED-IN-PART


BRADLEY R. GARRIS
Administrative Patent Judge


PAUL LIEBERMAN
Administrative Patent Judge


LINDA R. POTEATE
Administrative Patent Judge

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) BOARD OF PATENT
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) APPEALS AND
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LRP:pgg

APPENDIX

Rostoker teaches that:

the alpha aluminum oxide particles used for polishing exhibit the following characteristics. Preferably, the particle size is "X" nm, and the distribution of particle sizes is controlled to within "Y" nm, and the particles used for polishing are "Z" percent (%) in the alpha phase, where: "X" is 10-100 nm; such as 10, 20, 30, 40 and 50 nm, and is preferably no greater than 50 nm; and "Y" is approximately "P" percent of "X", where "P" is 10%, 20%, 30%, 40% or 50%, and is preferably no greater than 50% to ensure a narrow (Gaussian) distribution of particle sizes about "X"; "Z" is at least 50%, including at least 60%, 70%, 80% and 90%, and as high as 100%.

Rostoker, column 7, lines 4-17.

EXAMPLE 1 (Rostoker): Average particle size $X = 10$ nm

1. $Y = 10\%$ of 10 nm ($P \times X$) = 1 nm

Particle size distribution ($X \pm Y$) = 9-11 nm (10 ± 1 nm)

2. $Y = 50\%$ of 10 nm = 5 nm

Particle size distribution = 5-15 nm (10 ± 5 nm)

COMPARISON EXAMPLE 1: Average particle size = 10 nm

Claim 1: Particle size distribution = 0-30 nm (10×3)

Claim 19: Particle size distribution = 4-16 nm ($10 \times .4$;
10 x 1.6)

EXAMPLE 2: Average particle size = 100 nm

3. $Y = 10\%$ of 100 nm = 10 nm

Particle size distribution = 90-110 nm (100 \pm 10)

4. $Y = 50\%$ of 100 nm = 50 nm

Particle size distribution = 50-150nm (100 \pm 50)

COMPARISON EXAMPLE 2: Average particle size = 100 nm

Claim 1: Particle size distribution = 0-300 nm (100 \times 3)

Claim 19: Particle size distribution = 40-160 nm (100 \times .4;
100 \times 1.6)

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eristic of its flight —Narl Geographic) (the boy, who
-ing back, was rushing helter-skelter down the hill
Galsworthy) 4: to pour in large numbers in one
(passengers) ~ed ashore on seven of the eight
—Vernon Pile) (rooks were ~ing across the
—Webb) (innumerable guests and invitations: ~
Robert Bendiner) ~ vt 1: to emit or cause to flow; to
(his eyes ~ed tears) 2: to wave or display fully extended
radiant grille ~ing a flag —Kathryn Grayson) 3: to put
into the water: allow (a tow) to run out to full length
anchor buoy) (~ a paravane) (~ a grass line so that the
ship can grapple it and pick it up —Manual of Seamanship)
4: to subject to the action of water as a means of expediting
5: WASH (slaves were ~ing the gravel for tin ore —Charles
Kingsley) sp. see FLOW
stream anchor n: a light anchor for use with a bower in
narrow waterways
stream cable n: the cable of a stream anchor
stream capture n: CAPTURE 3
stream-er 'strēm(ə)r/ n -s (ME *stremer*, fr. *streamen* 'to
stream + -er —more at STREAM) 1 a: a flag that streams in
the wind; esp: PENNANT b: a wavy band resembling a flutter-
ing pennon (clouds ~ like ~s —O.E. Rolvaag) c: a
narrow strip (as of cloth or type paper) (a bat
winged down the back) (a ball (cottoned with ~)) d: a
FLY e: a ribbon poster esp. used in a window or display,
and often having a single line of wording 1; BANNER 2 f: a
parachute that streams out from the pack but fails to blossom
2 a obs: the tail of a comet b: a long gauche-like extension of
the solar corona brighter at the base and fading to invisibility
at the end, sometimes showing filamentous structure, and visible
only during a total solar eclipse ~ streamers pl: AURORA
borcaea 4 d: a electric brush discharge streaming out from
CORONA 2g 3: one that washes sand or gravel in search of ore
SYN see FLAG
streamer '\ ' vt -ED/-ING-/: to provide or decorate with
streamers
streamer fly n: any large wet fisherman's fly with long streamer
feathers, hair, or other appendages extending out behind the
hook and from the head
streaming method n: a method of feeding in which sheets are
overlapped as they approach the front guides on the feed-
board of a printing press
streamflow 'strēmflə/ n: water flowing in a stream channel;
specif: the velocity and volume of such water
stream-ing 'strēm(ŋ)ŋ/ n -s (ME *streaming*, fr. gerund of
streamen to stream —more at STREAM) an act or instance of
flowing; specif: CYCLOSIS
streaming adj [fr. pres. part. of *stream*] 1: issuing in or suf-
fused with stream 2: FLOWING, RUNNING (as cold) (a ~
umbrella) (as sunset) —stream-ly adv
streaming potential n: a potential difference that arises across a
capillary tube or membrane when a liquid is forced through it
—compare ZETA POTENTIAL
stream jam n: a log jam that reaches neither shore —called
also center jam
stream-less 'strēm(ə)l(ə)s/ adj: having no stream
streamlet 'strēm(ə)l(ə)t/ n -s ('stream + -let) 1: a small stream
2: a small line ~ n, often attrib ('stream + line) 1 a: LINE
or FLOW (~s of liquid flowing in a constricted tube —H.B.
Lemon & Michael Ference) b: the path of a fluid particle
relative to a solid body past which the fluid is moving in
smooth flow without turbulence (consider the ~s ~ around
the plane parts —S.A. Moss) 2 a: a contour offering minimum
resistance to a current (probably no animal or plant in the
water is without some ~s) b: a streamer (R.E. Coker) (the ~ of an
Mallory) c: was formed generally in a ~ —Norman
Mailer) b: a fluid line (~ makes it more improve the performance
of a typewriter but it may not effect)
streamline 'strēm(ə)l(ə)n/ vt 1 a: to adapt to a line of flow (even
without human assistance the controls of an airplane tend to
~ themselves) b: to provide with a contour offering mini-
mum resistance to a current (the fish is the first organism to
have its hind appendage ~ed into it —A.L. Krober)
(the nose line ~ed aluminum cowl giving a bullet-
like appearance —Aero Digest) c: to design with flowing
contours (~ apparatus for greater cleanliness and safety
—D.E. Pierce) 2: to bring up to date; renovate in appear-
ance or attitude: MODERNIZE (wants to ~ his people by
the trading on their fondest superstitions —Joseph H. Fielding) (~
the archaic judiciary system has been ~ed —J.H. Fielding)
the text, to bring it closer to the contemporary stage —John
Mason Brown) 3: to improve in order or discipline upon
4: INTEGRATE, ORGANIZE (everything is ~ed —doctrine, tactics,
strategy, weapons, armaments, all integrated, all enshrined in
a single dynamic —Lewis Hastings) b: to make simpler or
more efficient (machines that extrude damp clay ~ the
work of clay molders —Ford Times) (enacted legislation
combining our armed forces into a single department of de-
fense to ~ our defense machinery —Think) c: to reduce to
a minimum (school terms were ~ed ~ to get the graduate
sooner for industry —E.C. McVey)
streamlined 'strēm(ə)l(ə)n(ə)d/ vt 1 a: affording minimum resistance to
a fluid that: occurred to reduce drag (a ~ yacht) (~ engine
is a ~) b: ~ hounds chase a fleeing mechanical rabbit —Amer.
Guide Series: Ark) (go easy on ice cream till we get the figure
a bit more ~ —Auckland (New Zealand) Weekly News)
b: stripped of nonessentials: SIMPLIFIED, COMPACT
~ ticket ~ replacing the long tickets previously used for
transcontinental travel —Wall Street Jour.) (~ useless nooks
~ and efficient, with no empty space —Harriette Arnow)
c: effectively integrated: ORGANIZED
(the shrinking of the world ~ requires ~ and internationally
fluid lines: CURVILINEAR (~ watch bracelet) (~ pressure
cooker) 3: brought up to date: MODERNIZED (jumped from
the oxcart to the ultra ~ —Holiday) (has fashioned ~ to
version of the ~ novels —J.T. Winterich) 4: (of the flow of
or characteristic of stream flow: LAMINAR ~ Science)
streamlined flow n: a: interrupted flow (as of air) past a
solid body b: the direction at every point remains un-
changed with the passage of time: LAMINAR FLOW —compare
TURBULENT FLOW
streamliner 'strēm(ə)l(ə)n(ə)r/ n: one that is streamlined; esp: a stream-
lined train
streamlining n [fr. gerund of *streamline*] 1 a: contouring
for minimum resistance to a current (the ~ of aircraft)
b: curvilinear design (the ~ of household appliances is more
decorative than function) c: a: a device to increase efficiency
or eliminate waste b: obsolete or nonessential: MODERNIZA-
TION, SIMPLIFICATION (the ~ of factory operations —Narl
Stationer) (~ certainly reduced the number of opportunities
for misundressing —Jour. of Accountancy)
stream of consciousness 1: individual conscious experience
considered as a series of processes, intrapsychic events, or
experiences continuously moving forward in time —compare
CONSCIOUSNESS 3 2: MYSTICISM, MEDITATION
stream orchid n: a: a flower of the genus *Epipactis* (giant) native
to western North America and having greenish or purplish
flowers b: a flower of the genus *Heliconia* (giant) native
to the West Indies
stream power n: called also *grad-helliporine* (a
stream's potential energy)
streams pl: STREAMS, *pret 3d* and *pl* of STREAM
streamside 'strēm(ə)l(ə)n(ə)s(ə)d/ n: the land bordering on a stream

CORRECTED

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

04-1074
(Serial No. 09/136,483)

IN RE SUJEET KUMAR, HARIKLIA DRIS REITZ,
XIANGXIN BI, and NOBUYUKI KAMBE

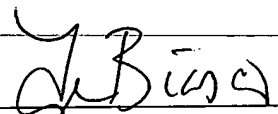
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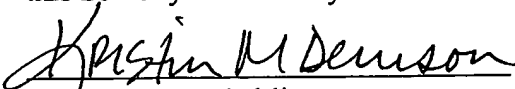
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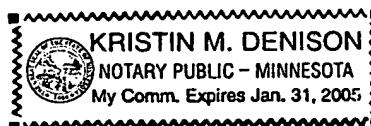
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